

Gastric impaction in a 7-month-old Rottweiler: a postmortem examination

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SUMMARY

A dead seven-month-old female Rottweiler dog was presented to the necropsy unit of the University of Ilorin Veterinary Teaching hospital for post-mortem examination. The owner complained of vomiting, salivating, and restlessness prior to the death of the dog. The stomach was filled with black polythene materials at necropsy, weighing 3 Kg. The gastric mucosa was hyperaemic with the right lobes of the lungs severely congested. The heart was globous with prominent coronary vessels. The liver showed areas of diffused necrosis with a slightly enlarged left kidney. Based on the above findings, it was diagnosed as a case of gastric obstruction from nylon. The cause and pathogenesis of gastric impaction are discussed.

Keywords: Gastric, mucosa, necropsy, hypereamia, polythene.

INTRODUCTION

Gastric impaction, intestinal obstructions, and death are among the consequences of the consumption of non-food items called foreign bodies in dogs (Tripathi *et al.*, 2010). Gastric impaction is a condition wherein foreign materials accumulate in the stomach, leading to a mechanical impediment to gastric digestion, dehydration, and emptying of the remaining part of the gastrointestinal tract (Mshelia *et al.*, 2015). This condition is uncommon but young dogs are more susceptible when compared to older dogs (Moles *et al.*, 2010). Associated clinical signs of gastric impaction include vomiting, stomach pain, and weight loss (Halfacree, 2010). The foreign materials may compromise the blood supply to the stomach and other intestinal segments, resulting in edema and ischemic necrosis (Ellison 1993).

In numerous research, a number of etiologic variables for canine impactions have been put forth. Dogs' feeding practices are one of these, as they frequently result in the development of stomach foreign bodies (Mshelia *et al.*, 2015). Dogs may also consume objects like buttons, marbles, stones, and bones, which can result in intestinal blockage (Sherding and Johnson, 1994). Additionally, some conditions such as tumors, gastritis, pyloric stenosis, gastric dilatation, volvulus, hernias, intussusceptions, and mesenteric torsion can result in intestinal blockage (Charles

et al., 2014). But dogs' indiscriminate feeding habits—specifically, their early consumption of inedible things—are the main contributor to gastrointestinal foreign bodies, which is also linked to the condition known as pica (Jayanthi *et al.*, 2018).

Clinical indications include anorexia, vomiting, melena, and stomach pain connected to gastric impaction (Jayanthi *et al.*, 2018). Animals may also get depressed, dehydrated, and lose a lot of weight, which can lead to chronic illnesses including hypovolemia (Halfacree, 2010; Suresh *et al.*, 2011). Abdominal palpation is rarely diagnostic unless a significant obstruction has taken place or the stomach is significantly impacted. Diagnostic techniques like computed tomography (CT), ultrasonography, and radiography are employed for a specific diagnosis and to determine the location inside the gastrointestinal system (Chiang & Chou, 2005). Among pathological diagnostic methods, the necropsy is essential for confirming, refuting, clarifying, modifying, or establishing a diagnosis among pathological examination methods (Cyrielle *et al.*, 2014)

CASE HISTORY

A 7-month-old, male Rottweiler weighed 24kg and was presented to the small animal clinic of the University of Ilorin Veterinary Teaching Hospital with a chief complaint of vomiting, salivating, and restlessness. The physiological

parameters on presentation were temperature of 39.5°C, respiratory rate of 37 breaths per minute, and heart rate of 155 beats per minute. The dog has tentatively been diagnosed with gastritis as a result of bacterial infection. The animal, on admission for three days, was stabilized and rehydrated using 5% dextrose saline intravenous fluid therapy at 25 drops/min for 3 days. Thereafter, an intravenous infusion of ciprofloxacin at 400mg/kg was administered for 3 days on day 4 the animal was discharged to the owner in good condition. Prior to the death of the animal, the owner released the dog to freely roam the compound for some days. In the early hour of day 8, the owner found the dog dead and presented for post-mortem at the necropsy unit of the Veterinary Teaching Hospital for diagnostic evaluation for the cause of its death

POST MORTEM FINDINGS

The carcass was in good body condition, with congested mucous membranes and easily removable hair. The vertebral subcutaneous tissue was hyperemic. The trachea contained brown liquid mixed with sand particles down to the bronchioles. The mucosa surface of the trachea was also inflamed. The right lobe of the lungs was severely congested. There were diffused multifocal areas of air-filled bubbles on the entire lungs. The stomach contained a black polythene

bag weighed 3kg mixed with semi-liquid creamy substances. The intestines were ballooned with the presence of pasty substances mixed with pieces of black nylon materials. The liver was slightly enlarged with diffused areas of necrosis and a distended gall bladder. The left kidney was slightly enlarged with areas of diffused necrosis. The renal fascia or capsule was thickened, cloudy, and adhered to the renal parenchyma tissue. The heart was slightly enlarged with dilated coronary vessels

DISCUSSION

The deviant feeding habit of animals is called pica (Kinsman *et al.*, 2021). This habit is usual in puppies because of their age, and also in rabid dogs (Nelson & Couto, 2014) It is also common in some mineral deficiency conditions of dogs and cats. Vomiting was reported as the early clinical sign followed by impacted stomach and intestinal obstruction (Mshelia *et al.*, 2015). There could also be dehydration which can lead to constipation. Polythene/nylon bags are grouped as non-biodegradable materials which cannot be digested or passed as such through feces by an animal reported by Reece, (2005). The feed ingredients in the stomach get trapped in between the polyethylene materials and become unavailable for gastric digestion, leading to indigestion (Singh, 2005). Polythene is made of chemicals

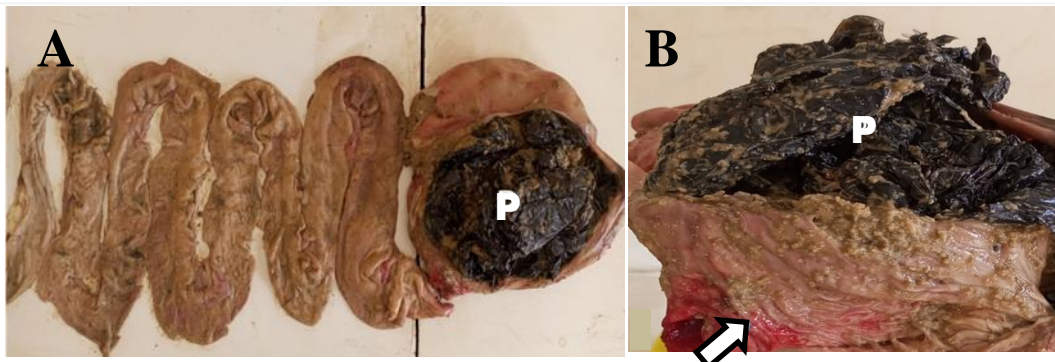


Figure I: (A): Photomicrograph of the stomach containing black polythene bags (P). (B): Gastric mucosa showing an area of inflammation (arrow).

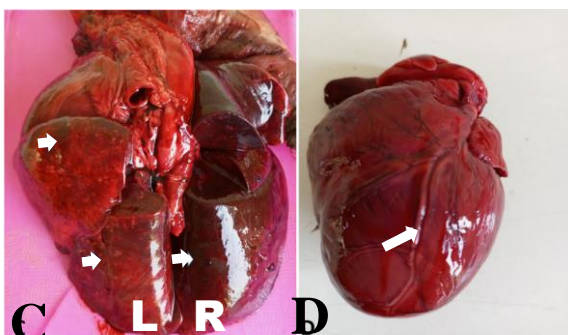


Figure II: Photomicrograph of visceral organs (C): showing the gross appearance of the lung with multifocal air-filled bubbles (arrowhead), in both the left (L) and right lobe (R) was congested, (D) The heart appeared globus with a prominent coronary vessel (arrow).

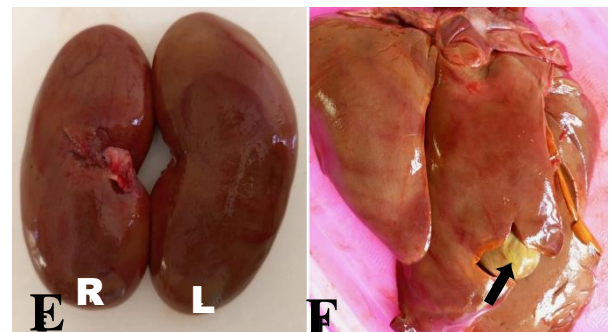


Figure III: Photomicrographs of visceral organs showing: (E) kidneys, with the right kidneys, appearing normal (R) and the slightly enlarged left kidney (L). The liver (F) showed diffuse areas of necrosis with a distended gallbladder (arrow)

such as acrylamide, bisphenols, cadmium, polyvinyl chlorides, and lead which are known to be toxic and cause immunosuppression (WHO, 2010). The polythene in the stomach also deposited organic salts in the digestive tract to polybezoarzoars which obstruct food movement, pain, and inflammation in the stomach (Singh, 2005). Young dogs are frequently affected as a result of their playful behaviors (Nelson and Couto, 2014). However, in adult dogs, behavioral disorders such as confinement living and social life restriction increase stress, anxiety, and pica syndrome behaviors (Kumar *et al.*, 2020, Kinsman *et al.*, 2021). Due to the non-digestibility of polythene and their inability to be passed out in the stool, as earlier stated they cause the stretching of the muscles of the stomach (Sheferaw *et al.*, 2014). The continuous presence of polythene materials in the stomach of an animal will affect the blood supply (Elina *et al.*, 2017) to the organ, which may lead to gastric ischaemia and atrophy of the stomach that will affect the normal digestion process according to Sheferaw *et al.*, 2014. The pathological consequences of gastric impaction include dysmotility of the gastrointestinal tract smooth muscles, electrolyte and acid-base imbalance, endotoxemia, hypovolemic shock, and marasmus (Singh, 2005). In severe and acute cases it may lead to the abrupt death of the animal as reported by Mshelia *et al.*, (2015) and Jayanthi *et al.*, (2018). A rounded apex of the heart indicates an enlargement of the heart called cardiomegaly. The swollen intestines and protruding stomach may have increased the volume and pressure in the abdominal cavity, putting more strain on the diaphragm and, in turn, the lungs, impairing breathing and causing death (Burti *et al.*, 2020). The clients said that the youngster who looked after the animal while he was away was purchasing food from the vendor, who had the food packaged in polythene bags.

It was suggested that the client board his dog at the kennel of the veterinary teaching hospital when he wished to take a longer trip. In conclusion, gastric impaction diagnosed during necropsy, in this case, was a result of a lack of knowledge of the feeding habits of dogs the youngster.

REFERENCES

- Charles, B.S., William, J.B., Barbara, M. & Lijie, F. (2014). Pathology: Necropsy and Gross Pathology. *Wiley online library*, Pp. 45-62.
- Chiang, K. H & Chou, A. S. (2005). Imaging of a gastrointestinal foreign body in a feline: Case report. *Tzu Chi Medical Journal*, 17(3), 187-189.
- Cyrielle F., Marc-Andre., D., Kate, A., Swan, S. & Guy, B. (2014). Radiographic Diagnosis of Mechanical Obstruction In Dogs Based On Relative Small Intestinal External Diameters. *Veterinary Radiology and Ultrasound*, 55(5), 472-479.
- Elina, R., Pia, B. & Merja, L. (2017). Radiographic and Ultrasonographic Findings in Three Surgically Confirmed Cases of Small Intestinal Ischemia Related to Mesenteric Volvulus or Intestinal Torsion in Dogs. *Open Journal of Veterinary Medicine*, (7), 99-110.
- Ellison, G. W. (1993). Intestinal obstruction. In: Disease Mechanisms in Small Animal Surgery. Ed M. J. Bojrab. Lea & Febiger, Philadelphia, PA, USA. Pp 252-257.
- Halfacree, Z. (2010). Surgical disease of stomach in small animals. *Journal of the British Veterinary Association: In Practice*, 32(4), 138-149.
- Jayanthi, N., Saahithya, R., Harish, L. J. & Rao, G.V.S. (2018). Unilateral Uterine Torsion and Rupture in a Labrador – A Pathomorphological Report. *International Journal of Current Microbiology and Applied Sciences*, 7(7), 1063-1068.
- Kinsman, R., Casey, R., & Murray, J. (2021). Owner-Reported Pica in Domestic Cats Enrolled onto a Birth Cohort Study. *Animals*, 11(4), 110-115.
- Kumar, R., Yadav, K., Jeevan, K., Hemanth, I., Rao, S., & Satyanarayana, M. L. (2020). Case report on trichophagia in dog: A rare condition. *Journal of Entomology and Zoology Studies*, 8(2), 1293-1294.
- Moles, A. D., McGhite, A., Schaaf, O. R. & Read, R. (2010). Sand impaction of the small intestine in eight dogs. *The Journal of Small Animal Practice*, 51(1), 29-33.
- Mshelia, C. P., Adeyanju, J. B., Abubakar, A. A., Yakubu, A. S., Jibril, A., Kolo, M. Y., Garba, S., Jibrin, M. S. & Balami, A. G. (2015). Severe gastric impaction in an 8-Year-old Nigerian local dog. *Sokoto Journal of Veterinary Sciences*, 13(1), 57-60.
- Nelson, R. W. & Coutom, C. G. (2014). Small animal internal medicine. Elsevier Health Sciences, St. Louis, Pp 477-481.
- Reece, O.W. (2005) Functional Anatomy and Physiology of Domestic Animals. Ames, Iowa University Press, Ithaca, USA. Pp 357-358.
- Sheferaw, D., Fikreysus, G., Metenyelesh, A., Dawit, T. & Etana, D. (2014). Ingestion of indigestible foreign materials by free grazing ruminants in Amhara Region, Ethiopia. *Tropical Animal Health and Production*, 46, 247-250.
- Sherding, R.G & Johnson, S. E (1994). Diseases of the intestines. In: Saunders Manual of Small Animal Practice Vol. VII. (SJ Birchard & RG Sherding, editors). WB Saunders Co., Philadelphia, Pp 713-714.
- Singh, B (2005). The harmful effect of plastic on animals. *Indian Cow*, 4, 10-18
- Suresh, K.R.V., Sankar, P., Kokila, S., Reeta, S.B, Ravikumar, P. & Dhana, L. N. (2011). Gastrotomy for retrieval of thoracic oesophageal foreign body using long forceps techniques in three dogs: Case report. *Journal of Advance Veterinary Research*, 1(1), 74-75.
- Tripathi, A. K., Soodan, J. S. & Kushwaha, R. B. (2010). Gastric Foreign Body Syndrome in a Golden Retriever Dog. *Intas Polivet*, 11 (2), 305-306.
- WHO. (2010) Exposure to dioxins and dioxin-like substances: A major public health concern. In: Preventing Disease through Healthy Environments. Public Health and Environment. World Health Organization, Geneva.